Evolution of Convective Environment over South Florida During July 2002: A Meteorological Overview of CRYSTAL-FACE

Henry Selkirk, BAERI-NASA Ames

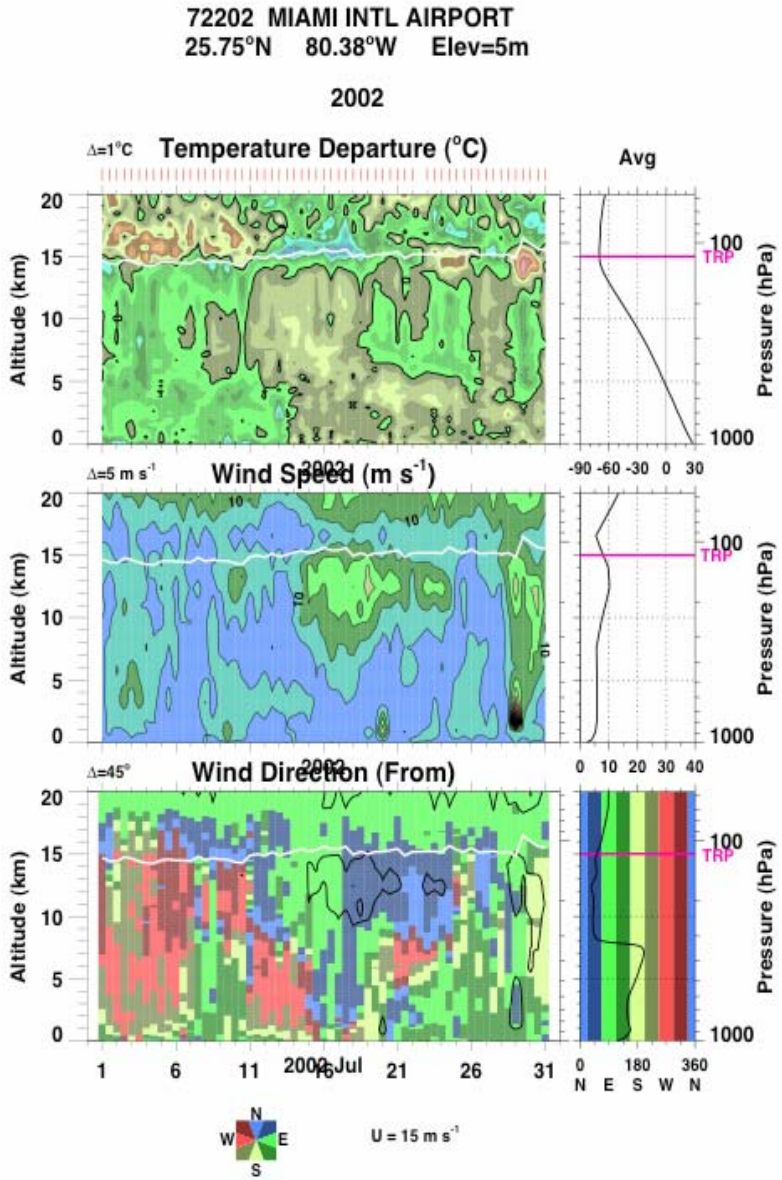
Leonhard Pfister, NASA-Ames

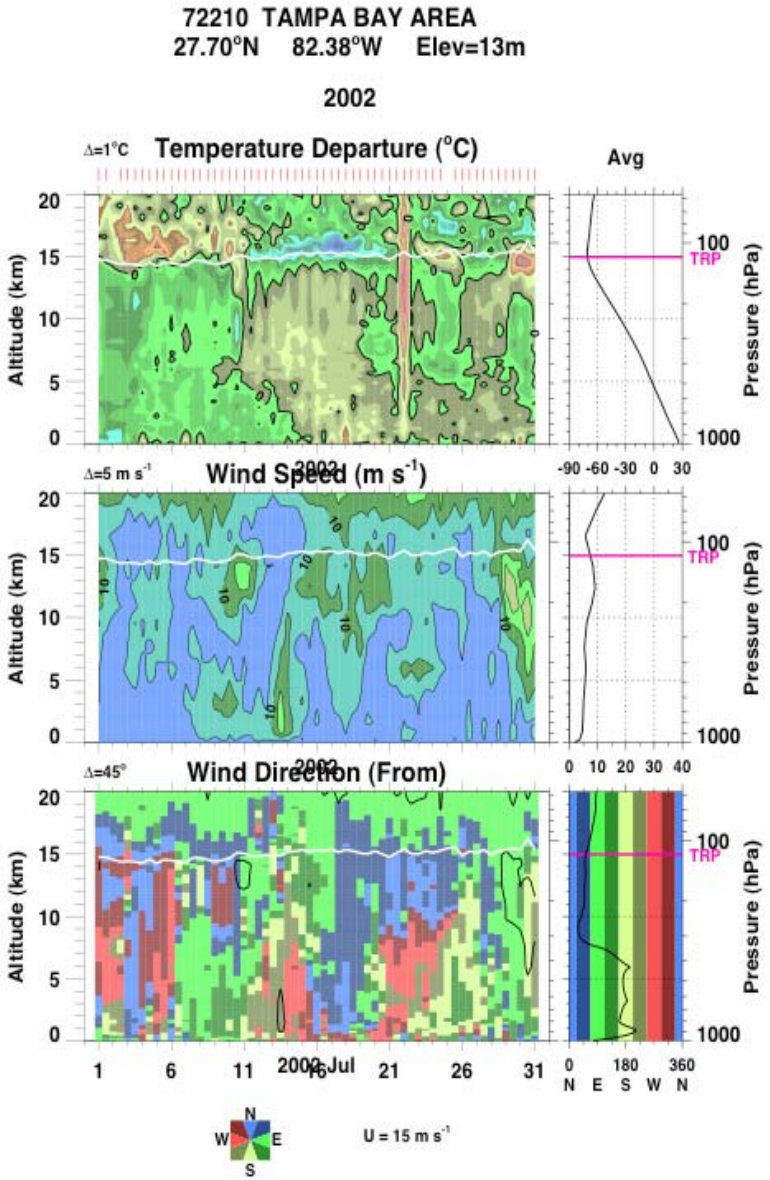
with help from Marion Legg (ARC) and Eric Nash (GSFC)

Outline

- Time curtain of Miami and Tampa Bay rawinsondes during July2002
- Evolution of the upper level flow over the eastern continent and its relation to tropopause temperatures over Florida
- Animation of 1/2-hourly 12 μm IR imagery over South Florida with upper- (150 hPa) and low-level (925 hPa) winds

Rawinsonde time histories





Evolution of upper levels and trop T

QuickTime™ and a PNG decompressor are needed to see this picture.

Convection & flow

- **4 Jul** - Cyclonic above, SWly below
- **6 Jul** - upr lvl weakening, SEly below
- **10 Jul** - strng oppsd upr & low levels
- **11 Jul** - upr lvl weakens, SWly low
- **13 Jul** - upr lvl Ely, low lvl SW
- **14 Jul** - strg SEly abv, Wly below
- **16 Jul** - Ely abv, anticylonic below
- **17 Jul** - anticylonic develops above
- **18 Jul** - strong Nely flow above
- **21 Jul** - anticylonic abv, SElys below
- **25 Jul** - Ely flow above & below, but weakening
- **26 Jul** - weak above
- **28 Jul** - Ely abv/blw again & strengthening

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Summary

- July 2002 very wet AND very active convectively in Florida, and in the CRYSTAL-FACE area of operations in particular
- Flow directions above and below were variable, but deep convection developed almost every day over south Florida - solar heating coupled with tons of moisture is VERY compelling forcing, even mid-month with warmer, more stable mid-troposphere
- Tropopause temperature variability coherent on the large-scale and tied to changes in tropospheric thickness (i.e. mean temperature through the mid-troposphere) - mid-month warming lifted and cooled tropopause in middle of upper level anticyclone
- Movement of anvil systems tied to upper level wind
- Lightning was copious over land AND water, concentrated in developing cells

Ongoing work

- **Preparation of met overview paper**
- **Collaboration with C-F modeling team (and others) in assessment of forecast model peformance**
- **Convective influence studies in support of tracer and microphysical studies (Co-I L. Pfister and C-F colleagues)**

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